THIRD SPACE LEARNING

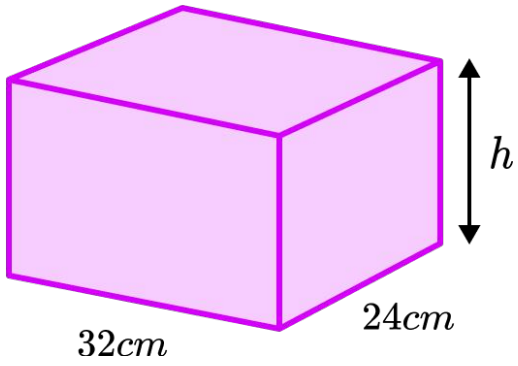
GCSE Exam Questions

Flow Rate | Ratio & Proportion

GCSE Exam Questions: Flow Rate

1) The diagram shows a container in the shape of the cuboid.

The base of the container is a rectangle measuring 32 *cm* by 24 *cm*.



A tap produces a flow rate of 4 litres per minute.

The tap can fill the container in 4 minutes and 48 seconds.

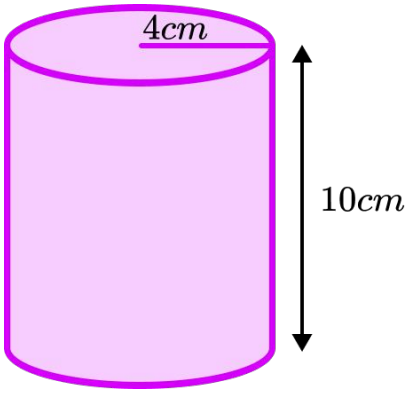
Using the fact that 1 *ml* = 1 cm^3, find the height of the container in centimetres.

_____ cm

(4 marks)

GCSE Exam Questions: Flow Rate

2) The organiser of a fun run needs to provide 120 cups of water for competitors to drink from during a race. Each cup is a cylinder of radius 4 *cm* and height 10 *cm* as shown in the diagram.



The organiser needs to fill all 120 cups with water from a tap which has a flow rate of 3.5 litres per minute. There is only 16 minutes available to get all of the cups filled.
Will the organiser get all of the cups filled in the available time?

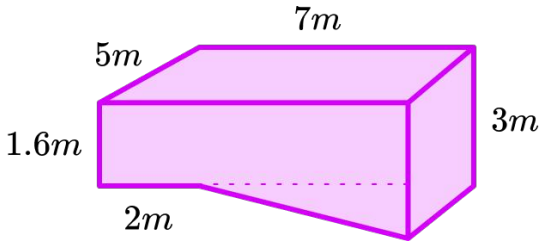
Show your working.

[1 *ml* = 1 cm^3]

(4 marks)

GCSE Exam Questions: Flow Rate

3) The image shows a full swimming pool that needs cleaning, so will be emptied by a pump.



After 30 minutes the water level has decreased by 40 cm.

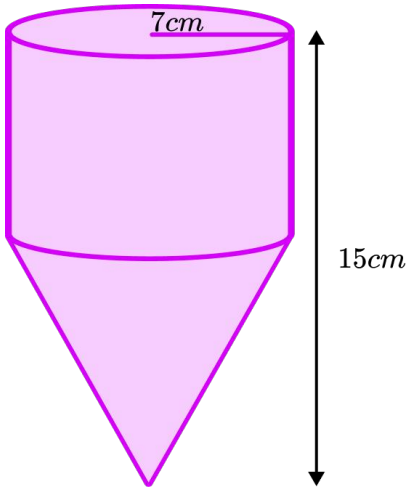
How much **extra** time will be required for the swimming pool to be completely empty? Give your answer in minutes.

.....mins

(6 marks)

GCSE Exam Questions: Flow Rate

4) Water is flowing in the the container shown at a rate of π millilitres per minute.



The container consists of a cylinder and a cone.

The heights of the cylinder and cone and in the ratio 2:3.

Find the time taken to completely fill the container.

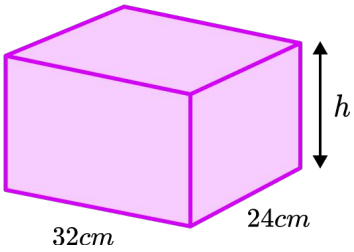
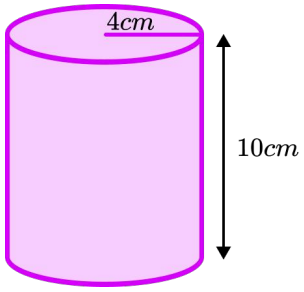
Give your answer in minutes.

[*Volume of a cone* = $\frac{1}{3}\pi r^2 h$]

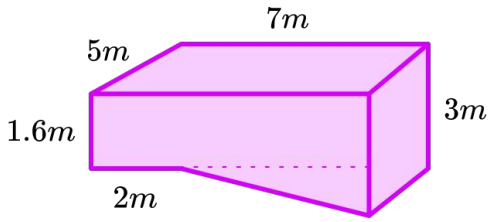
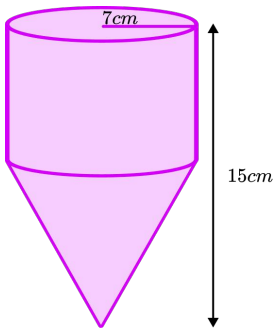
.....mins

(5 marks)

GCSE Exam Questions: Flow Rate Answers

	Question	Answer	Marks
1)	 The diagram shows a container in the shape of the cuboid. The base of the container is a rectangle measuring 32 *cm* by 24 *cm*. A tap produces a flow rate of 4 litres per minute. The tap can fill the container in 4 minutes and 48 seconds. Using the fact that 1 *ml* = 1 cm^3, find the height of the container in centimetres.	4 min 48 sec = 4.8 mins 4 litres per min = 4000 cm^3 per min 4000 x 4.8 = 19200 cm^3 $19200 \div (32 \times 24) = 25\,cm$	**(1)** **(1)** **(1)** **(1)**
2)	 The organiser of a fun run needs to provide 120 cups of water for competitors to drink from during a race. Each cup is a cylinder of radius 4 *cm* and height 10 *cm* as shown in the diagram. The organiser needs to fill all 120 cups with water from a tap which has a flow rate of 3.5 litres per minute. There is only 16 minutes available to get all of the cups filled. Will the organiser get all of the cups filled in the available time? Show your working. [1 *ml* = 1 cm^3]	Volume of 1 cup = $\pi \times 4^2 \times 10 = 502.65\ldots\ cm^3$ Total volume = 60318.5… cm^3 Finding time by dividing by 3500 or equivalent = 17.23.. minutes No	**(1)** **(1)** **(1)** **(1)**

GCSE Exam Questions: Flow Rate Answers

	Question	Answer	Marks
3)	 The image shows a full swimming pool that needs cleaning, so will be emptied by a pump. After 30 minutes the water level has decreased by 40 *cm*. How much **extra** time will be required for the swimming pool to be completely empty? Give your answer in minutes.	Volume of decrease = 14 000 000 cm^3 Flow rate = 466 666.6… cm3 per min or equivalent Remaining volume = $120 \times 500 \times 700 + \frac{500 \times 140}{2} \times 500$ = 59 500 000 cm^3 Remaining time = 59 500 000 ÷ 466 666.6.. 127.5 minutes	**(1)** **(1)** **(1)** **(1)** **(1)** **(1)**
4)	 Water is flowing in the the container shown at a rate of π millilitres per minute. The container consists of a cylinder and a cone. The heights of the cylinder and cone and in the ratio 2:3. Find the time taken to completely fill the container. Give your answer in minutes. [*Volume of a cone* = $\frac{1}{3}\pi r^2 h$]	Heights of cylinder and cone found as 6 *cm* and 9 *cm* Volume of cylinder = 294π cm^3 Volume of cone = 147π cm^3 Total volume = 441π cm^3 Time = 441 minutes	**(1)** **(1)** **(1)** **(1)** **(1)**

Where to go next?

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